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| APPLICATION NO.               | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-------------------------------|-------------|----------------------|---------------------|------------------|
| 10/725,416                    | 12/03/2003  | Kevin Cheng          | 3313-1074P          | 4756             |
| 2292                          | 7590        | 10/06/2005           | EXAMINER            |                  |
| BIRCH STEWART KOLASCH & BIRCH |             |                      | FEGGINS, KRISTAL J  |                  |
| PO BOX 747                    |             |                      | ART UNIT            |                  |
| FALLS CHURCH, VA 22040-0747   |             |                      | PAPER NUMBER        |                  |
|                               |             |                      | 2861                |                  |

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/725,416

Applicant(s)

CHENG ET AL.

Examiner

K. Feggins

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) \_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 9/18/2003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Althaus et al. (IBM Technical Disclosure Bulletin, Vol 23, No. 7A) in view of Murakami et al. (US 6896357 B2).

**Althaus et al. disclose the following claimed limitations:**

\* regarding claim 1, a compound inkjet print head printer (fig 1) with a compound print head module (10, 12), being characterized in that the compound print head module includes at least two print heads (10, 12) to provide ink droplets with different sizes of ink droplets (figs 3 & 4), so that the compound print head module simultaneously provides ink droplets of at least two sizes in a print stroke to form multi-gradation pixels with a reduced number of print strokes and an increased printing speed (pgs 2700-27002, figs 1, 3-4).

\* regarding claims 2 & 7, further comprising an ink-detecting module/lead screw/ to check the operation and relative position of the print heads of the compound print head module before ink droplet ejection (fig 1).

\* regarding claims 3 & 8, further comprising more than one tuning mechanisms/carriage/ to adjust the relative position of the print heads of the compound print head module (fig 1).

\* regarding claims 4 & 9, wherein the tuning mechanism includes a base, a screw-adjusting device and a sliding piece, the screw-adjusting device is mounted on the base in a manner to abut against the sliding piece through a top rod, so that when the screw-adjusting device rotates, the top rod is driven to push the sliding piece forth; two springs abutting against a side of the sliding piece opposite to the guide rod to achieve distance tuning; and the print heads being respectively mounted on their corresponding sliding pieces of the tuning mechanism (fig 1, the carriage assembly consisting of the lead screw, servo motor, base structures that the heads are attached to, carriage rods).

\* regarding claims 5 & 10, wherein the tuning mechanism is a motor control module/servo motor (fig 1).

\* regarding claim 6, a compound inkjet print head printer (fig 1) with a compound print head module (10,11), being characterized in that the compound print head module includes first (10) and second (11) print heads, wherein the volume of ink droplets from the first print head is N of one size, the volume of ink droplets from the second print head is of another size N being larger than M (figs 3-4), the ink droplets from the first

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and second print heads having at least one color, various gradations at proper pixel positions being printed with a combination of nozzle ink droplets from the first and ink droplets from the second print head (pgs 2700-27002, figs 1, 3-4).

**Althauser et al. does not disclose the following:**

- \* further regarding claim 6, printhead is N pico liter (pl) and the second head is M pl, N being larger than M

- \* regarding claim 1, ink droplets of a same color

**Murakami et al. discloses the following:**

- \* regarding claim 1, ink droplets of a same color (col 1, lines 18-29, col 6, lines 15-20) for the purpose of providing high-gradation and high-quality images to be printed at high speeds using dots of different sizes.

- \* further regarding claim 6, printhead having N pico liter (pl) and the second printhead having M pl, N being larger than M (col 6, lines 35-50) for the purpose of producing dots of different size.

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize ink droplets of a same color from a printhead having N pico liter (pl) and a second printhead having M pl, N being larger than M, as taught by Murakami et al. into Althauser et al. for the purpose of producing dots of different size and providing high-gradation and high-quality images to be printed at high speeds using dots of different sizes.

**Conclusion**

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Drake (US 5,208,605) discloses a multi-resolution roofshooter printheads. Rezanka (US 5,412,410) disclose an ink jet printhead for continuous tone and text printing. Kneezel et al. (US 5745131) disclose a gray scale ink jet printer having ink jet nozzles of different sizes.

**Communication With The USPTO**

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Feggins whose telephone number is 571-272-2254. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talbott Dave can be reached on 571-272-1934. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
K. FEGGINS  
PRIMARY EXAMINER